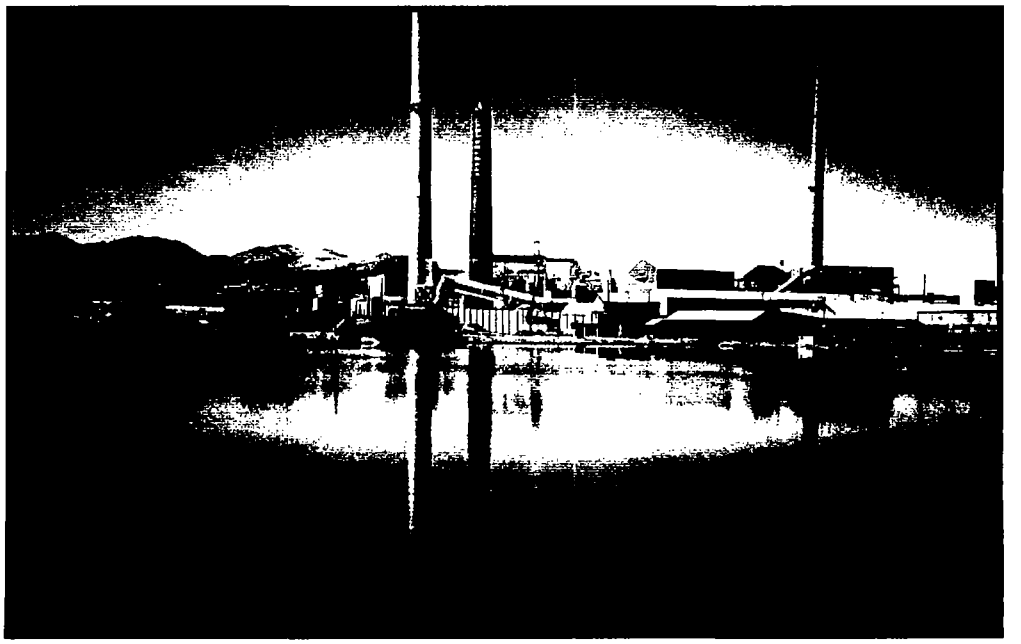
06/01/1998

STATEMENT OF WORK
FOR THE
EAST HELENA
SUPPLEMENTAL ENVIRONMENTAL PROJECT
CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

- DRAFT -

Prepared for:
ASARCO Incorporated
East Helena, Montana



Hydrometrics, Inc.®
consulting scientists, engineers and contractors

June 1998

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Prepared for:

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June 1998

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STATEMENT OF WORK
FOR THE
EAST HELENA SUPPLEMENTAL ENVIRONMENTAL PROJECT
CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

1. INTRODUCTION

1.1 PURPOSE

This document sets forth the Statement of Work (SOW) for implementing the East Helena Supplemental Environmental Project (SEP). Work will be conducted at the ASARCO East Helena Plant (herein referred to as the "ASARCO plant" or "the plant") located in East Helena, Montana in accordance with the RCRA Corrective Action Work Plan. This work will be performed in accordance with Consent Decree, Civil Action No. CV 98-3-H-CCL (Effective Date May 5, 1998). The purpose of this SOW is to:

- Define the scope of work which incorporates applicable requirements of the Consent Decree, including Section VIII (East Helena Supplemental Environmental Project), Section XI (Reporting) and Exhibit 2 (SEP Plan);
- Propose a schedule for completion of SEP Phase 1 and Phase 2.

1.2 DESCRIPTION AND SITE HISTORY

The ASARCO plant was constructed in 1888 by the Helena and Livingston Smelting and Reduction Company for the purpose of processing ores from local mines. In 1899, the American Smelting and Refining Company, today's ASARCO Incorporated, was formed with the East Helena Smelter being one of the original units. The ASARCO plant now serves as a custom, primary lead smelter which produces lead bullion from a variety of both foreign and domestic concentrates, ores, fluxes, and other non-ferrous metal-bearing materials. In

addition to the production of lead bullion, the plant also produces a copper by-product and sulfuric acid. The plant recovered zinc until October 1982.

As shown in Figure 1-1, the ASARCO plant is located immediately south of the City of East Helena, Montana. Prickly Pear Creek forms the eastern boundary of the plant and flows north through the community of East Helena, the Helena Valley, and into Lake Helena. Prickly Pear Creek is the primary source of water for Upper Lake, a small body of water adjacent to the south side of the plant. A small diversion structure at the southeast corner of the plant diverts water from Prickly Pear Creek into Upper Lake. Lower Lake is located at the ASARCO plant, just north of Upper Lake.

Lower Lake historically served as the major holding facility for plant water. In 1989, two one-million gallon steel tanks replaced Lower Lake as a storage site for plant water. Sludge, sediments, and marsh deposits were dredged from the lake between May 1994 and August 1996. In 1997, a curb and gutter were added along the west end of Lower Lake to maintain positive drainage away from the lake. A Montana Pollution Discharge Elimination System (MPDES) permit obtained in November 1996 and modified November 1997 authorizes the discharge of High Density Sludge (HDS) water treatment plant effluent to Lower Lake. Since Lower Lake is no longer used for plant water storage, ASARCO proposes to improve the environment in and around the lake as part of the SEP.

1.3 ASARCO 1997 ENHANCEMENTS INITIATIVE

Acting under its own initiative in 1997 before the Consent Decree, ASARCO enhanced the west end of Lower Lake during construction of the stormwater diversion curb by adding fill to further separate a plant service road from the lake. This fill was graded, planted and fenced to create a protected grassy shoreline embankment with trees and shrubs that will

ASARCO INCORPORATED EAST HELENA PLANT SUPPLEMENTAL ENVIRONMENTAL PROJECT STATEMENT OF WORK	**SITE LOCATION MAP**	FIGURE 1-1

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screen the lake from the ASARCO plant area. The 1997 Lower Lake enhancements included:

- Demolition of two abandoned drain pipe outlets to Lower Lake;
- Demolition and patching of pavement depressions to prevent pooling of water on the plant service road;
- Construction of approximately 300 feet of concrete curb and gutter along the lake-side of the plant service road that adjoined the west end of Lower Lake;
- Placement of approximately 1400 cubic yards of fill material along the west end of the lake to provide the substrate for a 10 to 15-foot wide vegetated shoreline embankment between the plant service road and Lower Lake;
- Planting 300 trees and shrubs and seeding grass to establish a vegetated shoreline embankment that provides a visual and physical screen between the ASARCO plant and Lower Lake;
- Construction of 300 feet of fence to physically separate the ASARCO plant area from the vegetated shoreline embankment on the west end of Lower Lake.

Spring 1998 observations indicate that the 1997 enhancements described above have improved the west end of Lower Lake. Demolition, patching, curb and gutter construction and embankment fill activities have created a system maintaining positive drainage away from Lower Lake. Vegetation has established a uniform cover across the embankment. Trees and shrubs are established and growing to provide a visual and physical screen between the ASARCO plant and Lower Lake.

1.4 PERFORMANCE OBJECTIVES

ASARCO proposes to expand the 1997 enhancement effort to the rest of the Lower Lake shoreline, portions of Upper Lake shoreline, and the area between the two lakes. This work will be completed in two phases as described in the Consent Decree.

1.4.1 Phase 1 Performance Objectives

SEP Phase 1 will supplement established native and naturalized vegetative communities that are developed along the 10 to 15-foot wide perimeter of Lower Lake and portions of the Upper Lake north and west shorelines. This supplementation will be accomplished through:

1. Identifing and improving site conditions that have precluded the establishment of vegetation on barren shorelines of Lower Lake and portions of Upper Lake north and west shorelines;
2. Filling portions of the Lower Lake perimeter to form an irregular shoreline to naturalize the site, create riparian habitat for adapted vegetative communities, expand and enhance wildlife habitat, and potentially improve water quality;
3. Planting vegetative screens along portions of north and west Upper Lake perimeter areas to enhance wildlife habitat and reduce local noise pollution.

1.4.2 Phase 2 Performance Objectives

SEP Phase 2 will revegetate the area between Upper Lake and Lower Lake to create a foothills grassland community comparable to established/undisturbed communities in the local area. This revegetation will be accomplished by:

1. Re-grading the area between Upper and Lower Lakes to form naturalized topographical contours to enhance upland vegetative and wildlife habitat;
2. Planting vegetative screens along the west side of the area between the lakes to enhance wildlife habitat and reduce local noise and air pollution.

1.4.2.1 Additional ASARCO Enhancement Initiatives

In order to integrate the Upper and Lower Lake system for the benefit of vegetation and wildlife and to complement the foothills grassland community, ASARCO will institute enhancements that go beyond the scope of the Consent Decree in Phase 2. The enhancements include:

1. Construction of a pipe conveyance directing water from Upper Lake to Lower Lake (across the area between the lakes) to enhance vegetation and wildlife habitat;
2. Introduction of a sensitive plant species (lesser rushy milkvetch) at selected upland locations between the lakes to expand its range and population.

1.5 SCOPE OF WORK

The scope of work for the SEP will expand on enhancements already instituted by ASARCO's initiative. The scope of work will be divided into two phases to achieve the performance objectives outlined in Section 1.4. The scope of work for Phase 1 of the SEP (shown in Figure 1-2) consists of:

1.5.1 Phase 1 Scope of Work

1. Baseline vegetation and wildlife measurements will be conducted in conjunction with the implementation of the SEP as part of the Data Collection Plan (Attachment 1). The area will be inspected to identify site conditions that have precluded the establishment of vegetation on barren shoreline locations;
2. Placement of approximately 10,000 cubic yards of fill along portions of the perimeter of Lower Lake to reconfigure the shoreline, naturalize the site, create riparian habitat for vegetation and wildlife, and potentially improve water quality;
3. Site condition improvements include grading up to one acre of Upper and Lower Lake shoreline areas as needed to reduce the slope sufficiently for the growth of vegetation and grading of up to one-half acre of selected locations adjacent to the top of the lake banks to maintain positive drainage away from the lakes;
4. Placement of up to four to six inches of coversoil on up to one acre of shoreline areas to assist the growth and establishment of vegetation;

Color Map(s)

The following pages contain color that does not appear in the scanned images.

To view the actual images, contact the Region VIII Records Center at (303) 312-6473.

PLANT NORTH

SCALE
0 (In Feet) 120

LEGEND

- SHORELINE FILL (TO BE REVEGETATED)
- TOPSOIL AND GRASS
- WETLAND AND RIPARIAN VEGETATION
- TREES AND SHRUBS
- NEW FENCE
- EXISTING FENCE

ASARCO INCORPORATED
EAST HELENA PLANT
SUPPLEMENTAL ENVIRONMENTAL PROJECT
STATEMENT OF WORK

PHASE 1 IMPROVEMENTS

FIGURE
1-2

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5. Planting of approximately 300 trees and shrubs and construction of approximately 400 linear feet of fence to screen ASARCO plant operations along portions of north and west Upper Lake perimeter areas for the enhancement of wildlife habitat and reduction of local noise pollution;
6. Seeding and planting of approximately one acre of Upper and Lower Lake shorelines to establish sustainable vegetative communities that supplement established communities that have developed along the 10 to 15-foot wide perimeter of Lower Lake and portions of north and west Upper Lake shorelines.

1.5.2 Phase 2 Scope of Work

The scope of work for Phase 2 will include additional enhancements to be instituted at ASARCO's initiative (Section 1.4.2.1). The improvement of site conditions will begin following a decision on the applicability of RCRA Corrective Action. The scope of work for Phase 2 of the SEP (shown in Figure 1-3) consists of:

1. Installation of a pipe conveyance and control gate between Upper and Lower Lake to further enhance Lower Lake revegetation and wildlife habitat;
2. Re-grading and fill, as necessary, to form naturalized topographical contours and enhance upland habitat;
3. Addition of up to four to six inches of suitable coversoil over approximately 4 acres between Upper and Lower Lakes to assist the growth and establishment of vegetation;
4. Planting of up to 1000 square feet at selected site locations between Upper and Lower Lakes to establish a sensitive plant species (lesser rushy milkvetch) in order to expand its range and population;

PLANT NORTH

SCALE
0 (In Feet) 120

LEGEND

- EARTH WORK PERFORMED DURING PHASE I (SEE FIG. 1-2)
- TOPSOIL AND GRASS
- TREES AND SHRUBS
- NEW FENCE
- TREES AND SHRUBS (PHASE I)
- EXISTING FENCE (PHASE I)

ASARCO INCORPORATED
EAST HELENA PLANT
SUPPLEMENTAL ENVIRONMENTAL PROJECT
STATEMENT OF WORK

PHASE 2 IMPROVEMENTS

FIGURE
1-3

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5. Planting of approximately 300 trees and shrubs and construction of approximately 400 linear feet of fence to screen ASARCO plant operations along the west side of the area between Upper and Lower Lakes for the enhancement of wildlife habitat and reduction of local noise and air pollution;
6. Seeding and planting of approximately four acres between Upper and Lower Lakes to establish a sustainable foothills grassland vegetative community.

2. DESCRIPTION OF DESIGN AND CONSTRUCTION ACTIVITIES

As indicated in Section 1.4, design and construction activities that are necessary to implement the SEP will be conducted in two phases. Phase 1 of the work addresses those work items associated with the wetlands and riparian areas that make up the shoreline of Lower and Upper Lakes. Phase 2 includes those work items associated with the four acre upland area positioned between the two lakes.

As part of general construction planning, submission and approval of a Five Year Noxious Weed Management Program is necessary to comply with State of Montana County Noxious Weed Control Act (Title 7, Chapter 22, Sections 7-22-2101 through 7-22-2153) MCA and Rules 4.5.201 through 4.5.204 for activities proposed in this SEP. A SEP Weed Management Plan will be developed for Lewis and Clark County Weed District approval prior to the implementation of Phase 1.

A SEP Health and Safety Plan for all project personnel is included in Attachment 2. This plan establishes policies and procedures to protect project personnel from potential hazards posed by field activities associated with this project. The plan provides measures to minimize potential exposure, accidents, and physical injuries that may occur during daily on-site activities and details actions to be taken during a site emergency. The plan complies with provisions of the Occupational Safety and Health Administration standard for personal safety for hazardous waste investigation and remediation personnel as mandated by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (29 CFR 1926.65).

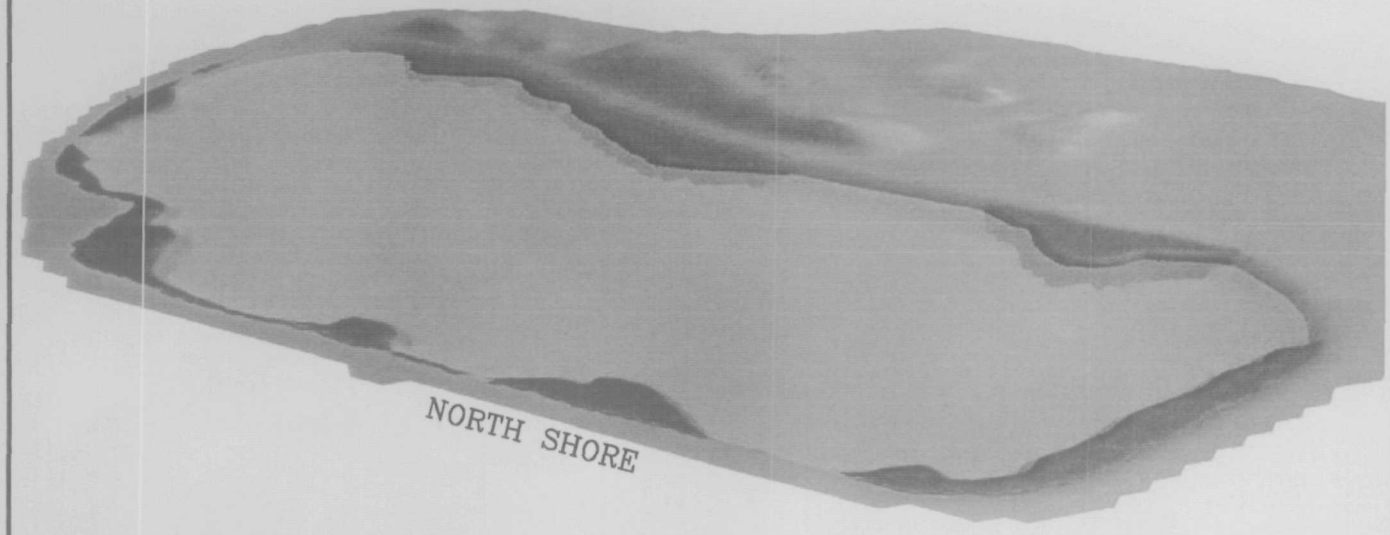
2.1 PHASE 1

Phase 1 will supplement established native and naturalized vegetative communities that are developing along the 10 to 15-foot wide perimeter of Lower Lake and northern portions of the Upper Lake shoreline. This will involve grading and reshaping of the shoreline and capping with suitable coversoil. In addition to supplementation of natural vegetation, fill will be added to portions of the Lower Lake perimeter to create an irregular, sinuous shoreline and

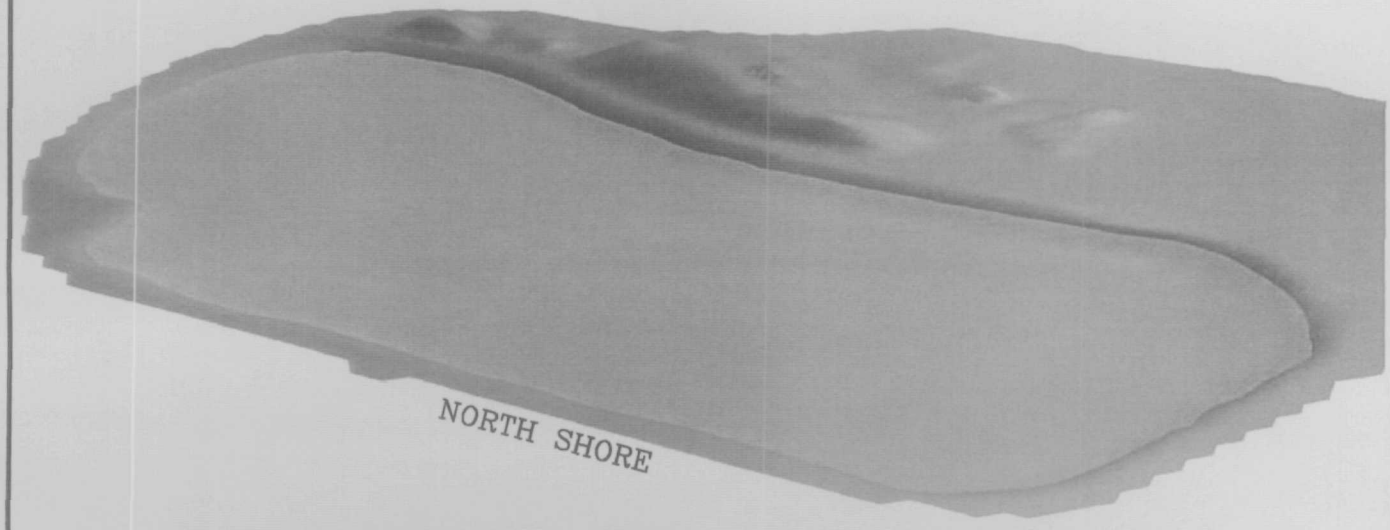
introduce new wetland and wildlife habitat while potentially improving water quality. A tree and shrub screen similar to that established along the western shoreline of Lower Lake in 1997 will be planted along a northwestern portion of the Upper Lake shoreline to screen it from traffic and industrial activity associated with the operation of the ASARCO plant. As was done at Lower Lake during the 1997 enhancements, a light fence will be constructed along this screen to supplement the vegetative barrier between the plant and Upper Lake.

2.1.1 Earthwork and Shoreline Improvements

To ensure the success of revegetation efforts, site conditions that have precluded the establishment of vegetation on barren shoreline locations will be identified. Shoreline bank slopes will be reduced where slopes exceed 3:1 in steepness. Perimeter locations will be graded as necessary to maintain positive drainage away from the lakes. Field stone and gravel will be placed into Lower Lake to contour the lake shoreline, creating shelter and shallows (Figure 2-1). Fill for construction of the lake contours will be obtained from the excess excavation materials associated with construction of the 1997 stormwater containment facility. This material, comprising approximately 14,000 cubic yards that passed the Toxic Characteristic Leach Procedure testing, is currently stockpiled southwest of the plant. Shoreline areas will be capped to within 12 to 18 inches of the water line with suitable coversoil. Coversoil suitability criteria are presented in Table 2-1. The shoreline area between the coversoil and water line will be armored with 12-inch nominal riprap to minimize erosion by wave action.



LOWER LAKE WITH SHORELINE IMPROVEMENTS



LOWER LAKE PRIOR TO SHORELINE IMPROVEMENTS

ASARCO INCORPORATED EAST HELENA PLANT SUPPLEMENTAL ENVIRONMENTAL PROJECT STATEMENT OF WORK	**EARTHWORK AND SHORELINE IMPROVEMENTS ON LOWER LAKE**	FIGURE **2-1**

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TABLE 2-1. COVERSOIL SUITABILITY CRITERIA

Parameter	Suitable Standard
pH	5.5 - 8.5
Electrical Conductivity	< 4 mmhos / cm
Sodium Adsorption Ratio	< 12
Acid-Base Potential	> -5 T / 1000T
C:N Ratio	< 20 : 1
Soil N	> 15 ug NO_3-N / g
Soil P	> 10 ug P / g (Bray extraction)
Soil K	> 75 ug K / g
Organic Matter	1 - 10 %
Saturation %	20 - 80 %
% Coarse Fragment Content	< 20 %
Texture	Loam Silt loam (sand > 15 %) Silty clay loam (clay < 35 %, sand > 15 %) Clay loam (clay < 35 %) Sandy clay loam Sandy loam

2.1.2 Revegetation of Shoreline Areas

The focus of revegetation efforts will be to supplement established native and naturalized vegetative communities that have developed along the 10 to 15-foot wide perimeter of Lower Lake and parts of Upper Lake north and west shorelines. Revegetation will result in the establishment of sustainable vegetative communities that are comparable to adjacent, undisturbed communities in the Upper Lake area. A preliminary inspection of the area in January 1997 (Hydrometrics, 1997a) identified wetland and riparian habitats that may be used as a reference area for revegetation planning and success quantification. Habitats and vegetation species observed during the preliminary inspection are listed in Table 2-2.

TABLE 2-2. WETLAND/RIPARIAN HABITATS AND VEGETATION SPECIES OBSERVED IN THE UPPER LAKE AREA, JANUARY 1997

Scrub-Shrub Wetland	
Willow	*Salix spp.*
Alder	*Alnus spp.*
Red-twig dogwood	*Cornus stolonifera*
Reed canary grass	*Phalaris arundinacea*
Western wheatgrass	*Agropyron smithii*

Emergent Wetland	
Cattail	*Typha latifolia*
Reed canary grass	*Phalaris arundinacea*
Giant wildrye	*Elymus cinereus*

Mesic Shrub	
Willow	*Salix spp.*
Alder	*Alnus spp.*
Russian Olive	*Elaeagnus angustifolia*
Boxelder	*Acer negundo*
Woods rose	*Rosa woodsii*
Red-twig dogwood	*Cornus stolonifera*
Western wheatgrass	*Agropyron smithii*

To ensure revegetation success and ecosystem continuity, selected Upper Lake wetland/riparian vegetation communities will be utilized as sources for vegetative transplants (cuttings and live clumps) to SEP locations at Upper and Lower Lake shoreline sites. These transplants will be collected on a low-density, dispersed basis (minimum of 15 feet between collections) throughout accessible portions of the Upper Lake area. Sites that are disturbed by these collection activities will be graded and seeded with annual rye and western wheatgrass. These grasses will provide interim cover for natural regeneration. Establishment of vegetation on remaining shoreline areas will be accomplished through seeding and transplanting using commercial Montana seed/nursery sources. To increase diversity and further enhance wildlife habitat, native plant species listed in Table 2-3 may be used along Upper and Lower Lake shorelines.

TABLE 2-3. ADDITIONAL NATIVE PLANT SPECIES PROPOSED FOR ESTABLISHMENT IN UPPER AND LOWER LAKE WETLAND/RIPARIAN HABITATS

Scrub-Shrub Wetland	
Black cottonwood	*Populus trichocarpa*
Douglas hawthorn	*Crataegus douglasii*
Tufted hairgrass	*Deschampsia caespitosa*

Emergent Wetland	
Sedge	*Carex spp.*
Rush	*Juncus spp.*
Bulrush	*Scirpus spp.*
Arrowhead	*Sagittaria spp.*

Mesic Shrub	
Snowberry	*Symphoricarpos albus*
Serviceberry	*Amelanchier alnifolia*
Douglas hawthorn	*Crataegus douglasii*
Tufted hairgrass	*Deschampsia caespitosa*

Attachment 1 to this SOW includes a data collection plan which addresses the methodology to be used for collecting data from the established wetland or riparian area that will serve as a control for setting revegetation goals for species and cover. It also contains the methodology for collecting data from the project area that will be used for determining the success of project revegetation efforts.

2.1.3 Surface Water Control Improvements

In the summer of 1997, drainage improvements exceeding those proposed in the SEP were instituted by ASARCO in order to enhance the west side of Lower Lake. An integral concrete curb and gutter was installed on the lake-side of the plant service road to maintain positive drainage away from Lower Lake. Drainage improvements also consisted of placing fill along the lake to raise the grade, the demolition of two abandoned drain pipe outlets, and

the removal and replacement of a portion of the plant service road pavement where depressions had developed. Additional work, consisting of minor filling and grading along sections of Upper and Lower Lake shorelines, will help ensure the maintenance of positive drainage away from the lakes.

2.1.4 Visual and Physical Screen

Following the placement of fill along the west end of Lower Lake in 1997, a screen of trees and shrubs was planted along the entire west end of the lake as part of site enhancements instituted by ASARCO. A light woven wire fence was erected between the curb and the trees to protect the plantings until they have a chance to mature. Similar plantings (grass, 300 trees and shrubs) and fencing (400 feet) will be located along the northwestern end of Upper Lake to visually and physically screen the lake from the traffic and industrial activity associated with the operation of the ASARCO plant.

2.2 PHASE 2

The area between the lakes contains stockpiled soils. As appropriate, any contaminated soils in this area will be removed as part of the RCRA Corrective Action. Phase 2 will establish an upland vegetative community in the area between Upper and Lower Lakes. This will involve capping the area with suitable coversoil (see Table 2-1) prior to revegetation with grasses, trees, and shrubs. Revegetation activities will include the introduction of a sensitive plant species (lesser rushy milkvetch) at selected site locations to expand the range and population of this species. Trees and shrubs will be added to enhance the quality of the upland habitat and to screen it from the ASARCO plant area.

A gated pipe conveyance between Upper and Lower Lake (at the southeastern end of the project area) will be built per ASARCO's plan to channel controlled flows of water from Upper Lake to Lower Lake for further vegetation and wildlife habitat enhancements

associated with lake system connection. The construction of this conveyance exceeds requirements of the Consent Decree.

2.2.1 Earthwork and Upland Improvements

Following a decision on the applicability of RCRA Corrective Action, the area between the lakes will be graded to improve its upland features. After grading, fill will be used as needed to raise the area between the lakes. Fill areas will then be further graded to complete a variable, naturalized topography that enhances upland habitat for vegetation and wildlife between Upper and Lower Lake. Prior to revegetation, the area will be covered with up to four to six inches of suitable coversoil (see Table 2-1 for suitability criteria).

2.2.2 Revegetation of Upland Areas

Revegetation of the area between the lakes will create a foothill grassland community comparable to established communities of this type in the East Helena area. Blending of this upland area into the planned Upper and Lower Lake wetland/riparian communities will create wildlife habitat opportunities. A preliminary inspection of the area in January 1997 (Hydrometrics, 1997a) identified occurrences of upland habitat that could be used as reference areas for revegetation planning and success quantification. These habitat and vegetation species, observed at several locations during the preliminary inspection, are listed in Table 2-4.

TABLE 2-4. UPLAND HABITAT AND VEGETATION SPECIES OBSERVED IN THE EAST HELENA AREA, 1997

Foothill Grassland	
Russian Olive	*Elaeagnus angustifolia*
Boxelder	*Acer negundo*
Rocky Mountain juniper	*Juniperus scopulorum*
Bluebunch wheatgrass	*Pseudoroegneria spicata*
Thickspike wheatgrass	*Agropyron dasystachyum*
Blue grama	*Bouteloua gracilis*
Idaho fescue	*Festuca idahoensis*
Needle-and-thread grass	*Stipa comata*
Sunflower	*Helianthus annuus*
Yarrow	*Achillea millefolium*

Revegetation of the area between the lakes will be accomplished through seeding and transplanting using commercial Montana seed/nursery sources. Additional native plant species are proposed for introduction to the area community in order to increase diversity and further enhance wildlife habitat. Native species under preliminary consideration are listed in Table 2-5.

TABLE 2-5. ADDITIONAL NATIVE PLANT SPECIES PROPOSED FOR UPLAND HABITAT ESTABLISHMENT IN THE AREA BETWEEN UPPER AND LOWER LAKES

Foothill Grassland	
Rough fescue	*Festuca scabrella*
Sandberg bluegrass	*Poa sandbergii*
Prairie coneflower	*Ratibida columnifera*
Lesser rushy milkvetch	*Astragalus convallarius*

The introduction of lesser rushy milkvetch will serve to expand the range and population of this species in the East Helena valley to which it is endemic. Lesser rushy milkvetch is

classified by the Montana Natural Heritage Program (Lesica and Shelly, 1991) as a sensitive species. This plant has no statutory federal or state protection (Lesica and Shelly, 1991). Establishment of a population of lesser rushy milkvetch will be conducted as a trial introduction, pending input from appropriate resource organizations (state/federal agencies, the Montana Natural Heritage Program and the Montana Native Plant Society) and the successful location/propagation of this species.

Attachment 1 to this SOW includes a data collection plan which addresses the methodology to be used for collecting data from the established upland area that will serve as a control for setting revegetation goals for species and cover. It also contains the methodology for collecting data from the project area that will be used for determining the success of project revegetation efforts.

2.2.3 Site Water Control Improvements

Construction of a gated 12 to 24-inch pipe conveyance, introducing a controlled, one-way flow of water from Upper Lake, will further enhance Lower Lake revegetation and wildlife habitat. This conveyance would be used to direct water from Upper Lake to Lower Lake connecting the lake systems and enhancing the exchange of aquatic life and vegetative propagules. The conveyance will be located at the southeastern end of the project area between Upper and Lower Lake (see Figure 1-3).

2.2.4 Visual and Physical Screen

A row of 300 trees and shrubs will be planted to connect the existing tree and shrub screen planted along the west end of Lower Lake with the tree and shrub screen planned for Phase 1 along the northwest corner of Upper Lake. The area will also be seeded to grass. The completion of this planting will result in a continuous row of trees and shrubs screening the lakes and the area between them from traffic and industrial activity associated with the operation of the ASARCO plant.

3. METHODOLOGY FOR DETERMINING SUCCESS OF PROJECT

Attachment 1 to this SOW details a data collection plan addressing the methodology to be used for collecting data from established vegetative communities that will serve as a control for setting revegetation goals for species and cover. It also contains the methodology for collecting data from the project area that will be used for determining the success of project revegetation and wildlife habitat improvements.

3.1 PHASE 1

Prior to the implementation of Phase 1 of the SEP, Phase 1 baseline vegetation and wildlife measurements will be collected. Shoreline revegetation areas and Upper Lake wetland/ riparian inspection sites identified in January 1997 (Hydrometrics, 1997a) will be revisited during the growing season to record baseline vegetation (species and cover) and wildlife data. A vegetation reference area will be delineated in the area of the Upper Lake wetland and riparian inspection sites identified in January 1997. Shoreline revegetation areas will be compared to this reference location on an annual basis until 70 percent or greater of reference area vegetation species and cover is observed for two consecutive growing seasons, at which time the shoreline SEP areas will be considered successfully revegetated.

The relatively small scale of this project precludes the institution of statistically-valid measurements that could quantify wildlife population increases resulting from the proposed site habitat improvements. Alternatively, transect measurements of wildlife diversity across shoreline areas to be revegetated and adjacent reference areas will be compared. These measurements will be performed on a semi-annual basis following the implementation of Phase 1 until revegetation success criteria are met.

3.2 PHASE 2

Prior to the implementation of Phase 1 of the SEP, baseline upland vegetation and wildlife measurements associated with Phase 2 will be collected. Upland revegetation areas between the lakes and upland inspection sites identified in January 1997 (Hydrometrics, 1997a) will

be revisited during the growing season to record baseline vegetation (species and cover) and wildlife data. A vegetation reference area will be delineated in the area of the upland inspection sites identified in January 1997 (Hydrometrics, 1997a). Upland revegetation areas between the lakes will be compared to this reference location on an annual basis until 70 percent or greater of reference area vegetation species and cover is observed for two consecutive growing seasons, at which time the shoreline SEP areas will be considered successfully revegetated.

The relatively small scale of this project precludes the institution of statistically-valid measurements that could quantify wildlife population increases resulting from the proposed site habitat improvements. Alternatively, transect measurements of wildlife diversity across upland areas to be revegetated and adjacent reference areas will be compared. These measurements will be performed on a semi-annual basis following the implementation of Phase 2 until revegetation success criteria are met.

4. MONITORING AND REPORTING

Baseline vegetation and wildlife measurements will be conducted in conjunction with the implementation of Phase 1 and Phase 2. Plans for the collection of vegetation and wildlife data are presented in Attachment 1. Final grade site soils will be sampled for an assessment of standard reclamation parameters (pH, nitrate, sodium, sulfate, conductivity, texture, lime, potassium, organic matter, and available phosphorous) and metals levels (including plant available arsenic, cadmium, copper, lead, and zinc).

A report detailing baseline wetland/riparian and upland conditions will be submitted to EPA within 30 days of SEP Phase 1 implementation. Following Phase 1 implementation, annual reports summarizing SEP vegetation, wildlife, and final grade site soils sampling and monitoring will be submitted to EPA. These annual reports will be prepared through both Phase 1 and Phase 2.

A SEP Completion Report will be submitted to EPA within 60 days after it is determined that SEP Phase 1 and Phase 2 activities are completed. The SEP Completion Report will contain the following information:

1. A description of the SEP as fully implemented;
2. A description of the environmental benefits resulting from SEP implementation;
3. Itemized and total net costs of the SEP;
4. A certification that the SEP has been fully implemented pursuant to the provisions of the Consent Decree and the SOW.

5. PROJECT SCHEDULE

Detailed SEP project schedules are dependent on regulatory review, activity authorizations by ASARCO, the completion of RCRA Corrective Action, and the limits of Montana's construction season (April through October). Phase 1 activities beyond the preparation of this SOW cannot be initiated until the completion of EPA review and approval. Following Phase 1, Phase 2 activities cannot begin until after soil removals, as appropriate, are approved and completed as part of the RCRA Corrective Action. A tentative schedule for SEP activities is presented in Table 5-1.

TABLE 5-1. SUPPLEMENTAL ENVIRONMENTAL PROJECT SCHEDULE

Milestone	Date
Effective Date of Consent Decree	May 5, 1998
Submit SOW for EPA approval	no later than July 3, 1998
Submit SEP Weed Management Plan for County Approval	no later than March 5, 1999
Begin Phase 1 Implementation	no later than April 5, 1999*
Submit Baseline Conditions Report to EPA	Within 30 days after implementing SEP Phase 1.
Submit Annual SEP Summary	January, 2000
Begin Phase 2 Implementation	April, 2000**
Submit Annual SEP Summary	January, 2001
Submit Annual SEP Summary	January, 2002
Submit Annual SEP Summary	January, 2003 (if necessary)
Submit SEP Completion Report	With 60 days following completion of SEP.
EPA Comments to SEP Completion Report	Within 60 days after SEP Completion Report is delivered.
Submit Revised SEP Completion Report	Within 30 days after receipt of EPA's written comments.

NOTES:

* Assumes EPA acceptance of SEP SOW by August 28, 1998
** Contingent upon final decision on applicability of RCRA Corrective Action.

6. REFERENCES

Hydrometrics. 1997a. Vegetation Habitats and Species Observed Near the Site of the ASARCO East Helena Plant. Memo to File. January, 1997.

Hydrometrics. 1997b. Proposed Supplemental Environmental Project (SEP) for the ASARCO East Helena Plant. Prepared for ASARCO Incorporated, February, 1997.

Lesica, P. and J.S. Shelly. 1991. Sensitive, Threatened and Endangered Vascular Plants of Montana. Montana Natural Heritage Program. Occasional Publication Number 1, April, 1991.

Montana. County Noxious Weed Control Act. 1991. Title 7, Chapter 22, Sections 7-22-2101 through 7-22-2153 MCA and Rules 4.5.201 through 4.5.204. Agricultural and Biological Sciences Division, Montana Department of Agriculture, Helena, Montana.

United States District Court for the District of Montana. 1998. Consent Decree, Civil Action No. CV 98-3-H-CCL. January 23, 1998.

ATTACHMENT 1

DATA COLLECTION PLAN

DATA COLLECTION PLAN

FOR THE

EAST HELENA SUPPLEMENTAL ENVIRONMENTAL PROJECT

CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

- DRAFT-

Prepared for:
ASARCO Incorporated
P.O. Box 1230
East Helena, Montana 59635

Prepared by:
Hydrometrics, Inc.
2727 Airport Road
Helena, Montana 59601

June 1998

DATA COLLECTION PLAN
FOR THE
EAST HELENA SUPPLEMENTAL ENVIRONMENTAL PROJECT
CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

1. WETLAND/RIPARIAN VEGETATION

SEP Phase 1 will supplement established native and naturalized wetland/riparian communities that are developing along the 10 to 15-foot wide perimeter of Lower Lake and portions of Upper Lake north and west shorelines. The focus of revegetation efforts will be to establish vegetative communities that are comparable to established wetland/riparian communities in the Upper Lake area. SEP Phase 1 revegetated Upper and Lower Lake shoreline areas will be compared to an Upper Lake reference area during the growing season on an annual basis. When 70 percent or greater of reference area species and cover is observed for two consecutive growing seasons, the shoreline SEP areas will be considered successfully revegetated.

1.1 REFERENCE AREA

Prior to the implementation of SEP Phase 1, Upper Lake wetland/riparian sites identified in January 1997 (Hydrometrics, 1997a) will be revisited during the growing season to record baseline species and cover data. A permanent 100-foot transect will be established across the reference area. Baseline and subsequent annual species and cover data will be collected at ten random quadrat (0.25 m^2 rectangular) locations along the transect. Data will be reduced and analyzed at Hydrometrics' Helena, Montana office.

1.1.1 Species

Plant species will be identified and recorded at each quadrat. Species observed in 20 percent of quadrats or less will be classified as incidental and excluded from reference area listing. Subsequent data reduction will produce a species list for comparison with project area results.

1.1.2 Cover

Plant cover by individual species will be recorded at each quadrat. This data will be subsequently reduced for comparison of total vegetative cover with project area results.

1.2 PROJECT AREA

Prior to the implementation of SEP Phase 1, shoreline revegetation areas will be visited during the growing season to measure baseline species and cover data. These and subsequent annual measurements of species and cover will be collected at ten random quadrat (0.25 m^2 rectangular) locations along one shoreline transect at Upper Lake and one shoreline transect at Lower Lake. Each lake transect will extend the length of the revegetated shoreline. Data will be reduced for comparison with reference area data at Hydrometrics', Helena, Montana office.

1.2.1 Species

Plant species will be identified and recorded at each quadrat. Species observed in 20 percent of quadrats or less will be classified as incidental and excluded from project area listing. Subsequent data reduction will produce a species list for comparison with reference area results.

1.2.2 Cover

Plant cover by individual species will be recorded at each quadrat. This data will be subsequently reduced for comparison of total vegetative cover with reference area results.

2.0 UPLAND VEGETATION

SEP Phase 2 revegetation of the area between Upper and Lower Lakes will create a foothill grassland community comparable to established communities of this type in the East Helena area. The SEP Phase 2 revegetated area will be compared to an upland reference area near the facility during the growing season on an annual basis. When 70 percent or greater of reference area species and cover is observed for two consecutive growing seasons, the upland SEP area will be considered successfully revegetated.

2.1 REFERENCE AREA

Prior to the implementation of Phase 1 of the SEP, upland revegetation areas between the lakes and upland inspection sites identified in January 1997 (Hydrometrics, 1997a) will be revisited during the growing season to record baseline species and cover data. A vegetation reference area will be delineated (as a permanent 100-foot transect) in the area of the upland inspection sites identified in January 1997. Baseline and subsequent annual species and cover data will be collected at ten random quadrat (0.25 m^2 rectangular) locations along the transect. Data will be reduced and analyzed at Hydrometrics', Helena, Montana office.

2.1.1 Species

Plant species will be identified and recorded at each quadrat. Species observed in 20 percent of quadrats or less will be classified as incidental and excluded from reference area listing. Subsequent data reduction will produce a species list for comparison with project area results.

2.1.2 Cover

Plant cover by individual species will be recorded at each quadrat. This data will be subsequently reduced for comparison of total vegetative cover with project area results.

2.2 PROJECT AREA

Prior to the implementation of Phase 1 of the SEP, upland revegetation areas between the lakes will be visited during the growing season to measure baseline species and cover data.

These and subsequent annual measurements (following implementation of Phase 2) of species and cover will be collected at ten random quadrat (0.25 m^2 rectangular) locations along a 100-foot transect across the project area. A permanent 100-foot transect will be established across the project area when final grading is completed. Data will be reduced for comparison with reference area data at Hydrometrics' Helena, Montana office.

2.2.1 Species

Plant species will be identified and recorded at each quadrat. Species observed in 20 percent of quadrats or less will be classified as incidental and excluded from project area listing. Subsequent data reduction will produce a species list for comparison with reference area results.

2.2.2 Cover

Plant cover by individual species will be recorded at each quadrat. This data will be subsequently reduced for comparison of total vegetative cover with reference area results.

3.0 TERRESTRIAL WILDLIFE

The small scale of the proposed project precludes the institution of statistically valid measurements that could quantify changes in wildlife populations resulting from the proposed site improvements. Therefore, changes in wildlife use of the sites that may occur as a result of site improvements will be qualitatively assessed.

Three transects will be established in areas scheduled for restoration. The first will comprise the entire shoreline of Lower Lake scheduled for modification in Phase 1. The second would consist of that portion of the shoreline of Upper Lake scheduled for modification in Phase 1. The third would cross the upland site between Upper and Lower Lakes, scheduled for modification in Phase 2.

Prior to the implementation of Phase 1 of the SEP, each transect will be surveyed once in spring and fall for baseline wildlife data. These semi-annual surveys will continue at the respective sites following implementation of Phase 1 and Phase 2, proceeding until SEP completion. Information collected will include: a) notes and photographs describing the habitat within the project area on each transect; b) wildlife species recorded by sightings or evidence (tracks, scats, etc.) within the project area on each transect; c) notes and photographs describing the habitat adjacent to the project area on each transect; and d) wildlife species recorded by sightings or evidence (tracks, scats, etc.) adjacent to the project area on each transect. This latter category would include all species visible anywhere within the Upper and Lower Lakes vicinity from the transects and would provide a list of species that could therefore potentially use the project areas. For the purposes of this assessment, the transects examined in a) and b) will be approximately two meters wide.

In addition to the three transects, incidental observations of wildlife and/or their evidence will be recorded in other areas, particularly south of Upper Lake. These species will further complete the potential species list.

Data will be reported as species diversity observed by season (spring and fall) and by transect vs. adjacent areas. Because the project areas to be assessed are relatively narrow and/or small, differences in species diversity between treated and untreated areas are expected to be small. However, as the site matures, (particularly after Phase 2), some changes may become evident.

ATTACHMENT 2

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

FOR THE

EAST HELENA SUPPLEMENTAL ENVIRONMENTAL PROJECT

CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

Prepared for:

ASARCO Incorporated
P.O. Box 1230
East Helena, Montana 59635

Prepared by:

Hydrometrics, Inc.
2727 Airport Road
Helena, Montana 59601

June 1998

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HEALTH AND SAFETY PLAN

FOR THE

EAST HELENA SUPPLEMENTAL ENVIRONMENTAL PROJECT

CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

CONSENT AGREEMENT

I have reviewed the Hydrometrics Health and Safety Plan for this project. I understand its purpose and consent to adhere to its policies, procedures and guidelines while working on this project.

Print Name	Signature	Date	Company
Print Name	Signature	Date	Company
Print Name	Signature	Date	Company
Print Name	Signature	Date	Company
Print Name	Signature	Date	Company
Print Name	Signature	Date	Company

HEALTH AND SAFETY PLAN
FOR THE
EAST HELENA SUPPLEMENTAL ENVIRONMENTAL PROJECT
CONSENT DECREE CIVIL ACTION NO. CV 98-3-H-CCL

1. INTRODUCTION

This Health and Safety Plan (HASP) is designed for use by all employees, general contractor, subcontractors, visitors and observers conducting or observing the work addressed in this project. The General Contractor can adopt the requirements of this HASP, but must identify the key personnel involved in implementing this plan.

Any tasks associated with remediation activities associated with the site must be performed in accordance with this site specific HASP designed to ensure that employees are adequately protected from the chemical and physical hazards present at the site.

1.1 PURPOSE OF SAFETY/HEALTH PLAN

This site safety plan establishes policies and procedures to protect remedial action personnel from the potential hazards posed by field activities associated with this project. The plan provides measures to minimize potential exposure, accidents, and physical injuries that may occur during daily on-site activities and details actions to be taken during a site emergency. This site safety plan complies with provisions of the Occupational Safety and Health Administration (OSHA) standard for personal safety for hazardous waste investigation and remediation personnel as mandated by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (29 CFR 1926.65). This plan does not apply to plant operating personnel that are covered under the ASARCO Operating Plant Safety Program.

This plan must be observed by all personnel including all contractors, subcontractors, and observers participating in remediation activities. To help ensure safety compliance, all field

participants and observers must read this plan and sign a certification stating that they agree to comply with the plan conditions.

1.2 FIELD ACTIVITIES

The scope of field activities focuses on the continuing enhancement of the Lower Lake shoreline, the adjacent portions of Upper Lake shoreline, and the area between the two lakes. A detailed description of activities is in the Statement of Work.

The project will be conducted in two phases. Phase I includes work associated with the wetlands and riparian areas that make up the shoreline of Lower and Upper Lakes, while Phase II includes work associated with the upland area between the two lakes. Both phases include performing earthwork, planting vegetation, and installing fences.

1.3 KEY MANAGEMENT

Efficient on-site operation requires that key personnel be identified and that their roles, responsibilities and scope of authority be clearly defined. The contractor shall designate individuals responsible for the roles below.

General Supervisor

The General Supervisor is responsible for implementation of the Work Plan and compliance with the HASP.

Site Safety Officer

The Site Safety Officer shall verify compliance with this HASP. The Site Safety Officer has the authority to temporarily suspend site operations for remedial action activities. Operations may resume only after appropriate measures have been developed through the combined efforts of the General Supervisor and Site Safety Officer.

2. HAZARD EVALUATION

2.1 CHEMICAL SUBSTANCES OF CONCERN

The following substances are known or suspected to be present on site. The primary hazards associated with each are identified:

Substance Involved	Primary Hazard
Cadmium	Toxic on inhalation, ingestion; suspected human carcinogen through inhalation only.
Arsenic	Toxic on inhalation, ingestion; skin irritant; known human carcinogen.
Lead	Toxic on inhalation, ingestion.

A summary of the relevant standards and exposure guidelines for these substances is in Appendix A.

2.2 SAFETY HAZARDS

Work activities may expose remedial action field personnel to potential physical hazards including mobile equipment and slippery surfaces.

3. TRAINING

Personnel performing earthwork, shoreline improvements, and upland improvements in both Phase I and II shall have 40 hours of initial safety as required by OSHA 29 CFR 1926.65 along with receiving a minimum of three days of field experience under the direct supervision of trained supervisors.

Management supervisors shall receive an additional eight hours of specialized training specific to the work site.

Workers and supervisors shall receive eight hours of refresher training annually to reemphasize the initial training and to update employees on new policies and procedures.

Personnel involved only with planting vegetation and installing fencing will not require the above training, however they will be required to receive all other training in this section, and be required to comply with all other provisions of this HASP.

Field personnel working on this project will receive training regarding the contents of this HASP.

3.1 RESPIRATOR TRAINING

Field personnel will be provided air purifying respirators designed to protect against identified hazards. A quantitative fit test using a Portacount fit testing unit will be administered to such workers no less than annually. Employees must complete a mandatory OSHA questionnaire which is reviewed by a physician and approved by a health care professional prior to fit test. Demonstrations of techniques used to determine good respirator fit is part of the quantitative fit test procedures. Respirator-wearing personnel will receive training in the proper use, limitations, proper storage, maintenance, and cleaning of respirators.

3.2 HAZARD COMMUNICATION

Field personnel will be trained in the hazards of exposure to lead, arsenic and cadmium for the tasks they will perform. Information in Appendices B, C, and D are included with this training.

4. SITE CONTROL

The remediation area is delineated into Exclusion Zones, Contamination Reduction Zones, and Clean Zones.

4.1 EXCLUSION ZONES

Exclusion Zones will be restricted to 40-hour HAZWOPER trained field personnel with proper personal protective equipment. Any areas where earthwork, shoreline improvements or upland improvements is being performed is designated an "Exclusion Zone." Personal protective equipment required in the exclusion zone is covered in 5.0 "Health and Safety Protection".

4.2 CONTAMINATION REDUCTION ZONES

Gross decontamination will be performed just inside the border of the exclusion zone. Field personnel will be required to wash hands and face before eating, smoking or chewing, and prior to leaving the site at the end of the shift. A change facility with storage lockers (or equivalent) will be available so each field personnel has one locker for street clothing, and one locker for work clothing. If the project is anticipated to take six months or more, then a two section (dirty side/clean side) shower facility will be required. The decontamination procedures are outlined in 7.0 "Decontamination". The change facility will be cleaned on a regular basis.

4.3 CLEAN ZONES

Clean zones will need to be designated for lunch and break periods. Also, if an office area is used for this project, it will need to be located in the clean zone. No protective clothing will be allowed in any clean zones. All the clean zones will be cleaned on a regular basis.

All field personnel are restricted to the area within and immediately surrounding the remediation project. No personnel are allowed within ASARCO smelter operations.

5. HEALTH AND SAFETY PROTECTION

5.1 PERSONAL PROTECTION EQUIPMENT

The minimum level of protection used in the Exclusion Zones is level C.

5.1.1 Level C Requirements

1. Level C personal protective equipment requirements are:
2. Hard hat;
3. Steel-toed boots;
4. Safety glasses;
5. Cotton coveralls;
6. Half-face respirator using HEPA/acid gas filters;
7. Hearing protection, when needed.

When outside of the exclusion zone, but not within the designated clean zone, respirators may be removed from the face and worn around the neck except when there is dust in the air, when operating equipment or driving vehicles, and when handling any ground materials within the ASARCO East Helena Plant boundaries.

In addition to the above protective measures, any work where there is significant skin exposure to water from Lower Lake, measures to prevent skin contact must be taken. Personal protective equipment such as coveralls manufactured of waterproof material, waterproof gloves, and waterproof boots can be used.

5.2 PERSONAL AIR MONITORING

Personal air monitoring will be conducted to document exposure to arsenic, lead and cadmium. This will assure field personnel are adequately protected.

5.3 HEAT STRESS

The potential for heat stress depends on the type of protective gear being worn, the ambient temperature, and the amount of activity. Work cycle lengths will be based initially on subjective input from personnel. Employees will report any cases of dizziness, excessive sweating, increased respiratory rate, or pulse and are to leave the work area immediately if these conditions are noted. Work cycle lengths will be reduced and a monitoring program will be initiated if the above are noted. Work cycles will be reduced if a pulse rate of greater than 110 is noticed at the beginning of the break. Personnel with elevated rates will not return to work until the pulse has lowered to their resting rate. The ASARCO medical department is available to handle any heat stress situation, with the exception of heatstroke and unconsciousness. If an employee is overcome with heatstroke or becomes unconscious, the 9-1-1 service will be called, according to the procedures outlined in Section 8.0 "Emergency Response". First-aid procedures will be used for heat related conditions, as necessary.

5.4 COLD STRESS

During on-site remedial activities, workers may also be exposed to cold temperatures. Factors leading to hypothermia and frostbite include ambient temperature, wind velocity, exposure time, and insufficient cold-weather protective gear. Signs of excess cold exposure include uncontrollable fits of shivering, slurred speech, memory lapses, immobile hands, stumbling, drowsiness, and exhaustion. Treatment for these symptoms are to get the victim out of the wind and cold, remove wet clothing, supply a warm drink, and keep victim warm with blankets or clothing.

5.5 HOUSEKEEPING

Housekeeping is an essential element in helping to maintain exposures below the action and permissible exposure levels for lead, arsenic, and cadmium. Housekeeping will be performed in the: change and/or shower facility, office and/or lunch facility, and laundry facility. There will be no facility cleaning using dry sweeping or shoveling practices.

5.5.1 Change and/or Shower Facility

Cleaning of the change and/or shower facility will be done on a regular basis. Cleaning includes mopping the floors, wiping down the benches, disinfecting the sink basins, as well as disinfecting the showers.

If air sampling indicates field personnel exposures above OSHA's PEL, then a HEPA vacuum cleaner will be used to clean this facility.

5.5.2 Office and/or Lunch Facility

Cleaning of the office and/or lunch facility will be done on a regular basis. Cleaning will include mopping the floors and wiping down all of the fixtures in the facility.

5.5.3 Laundry Facility

Cleaning of the laundry facility will be performed on a regular basis. Cleaning will include mopping the floor and cleaning the counter and appliances.

If air sampling indicates field personnel exposures above OSHA's Permissible Exposure Limit, then a HEPA vacuum cleaner will be used to clean this facility.

5.6 EQUIPMENT SAFETY

All mobile equipment with limited visibility to the rear shall be equipped with audible back-up alarms. If mobile equipment is operated at night, it shall be equipped with head lights and tail lights. All equipment will be maintained in good condition.

When the operator leaves the cab of mobile equipment, emergency brakes shall be set and any hydraulics released. If a truck is parked on an incline, it shall have the tires blocked.

Mobile equipment shall not exceed the ASARCO plant speed limit of 15 mph.

When refueling, engines on all equipment shall be shut off. All mobile equipment will be supplied with a fire extinguisher with a rating of not less than 2-A:10B:C rating, and the service truck will be supplied with a fire extinguisher with a rating of not less than 20B:C rating.

5.7 HOISTING EQUIPMENT AND MATERIALS

Equipment and materials being hoisted shall be hoisted by Montana-certified operators using OSHA-approved cranes or hoists. Slings shall be of sufficient diameter to lift the load. Tag lines need to be used and no personnel are allowed under any load.

5.8 ELECTRICAL SAFETY

Electrical power tools will continuously be inspected for damage. Electric tools with frayed cords or broken housings will be tagged and taken out of service.

If tools are used in wet conditions, they must be listed or labeled as double insulated. All extension cords will be of the three wire ground type and be connected to a ground fault circuit interrupter (GFCI). If extension cords are not plugged into a permanently mounted GFCI, then the extension cord must be supplied with a waterproof GFCI. Extension cords that are spliced, worn, or frayed are not allowed to be used. Extension cords must have the manufacturers rating on the cord and it must be legible; if it is not legible the cord must be taken out of service.

5.9 MISCELLANEOUS SITE SAFETY RULES

Miscellaneous General site safety rules include the following:

- Smoking, eating, chewing, applying cosmetics, etc. is only allowed in the designated lunchroom;
- A minimum of two personnel shall be on site at all times;
- No horseplay is permitted;

- Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried;
- Seat belts and anchors meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) shall be installed in all motor vehicles.

6. MEDICAL SURVEILLANCE/BIOLOGICAL MONITORING

Field personnel will be required to participate in an initial baseline blood lead determination, and an exit blood lead determination. If personal air monitoring indicates exposure above the action level for lead (30 μ/m^3), field personnel will receive a blood lead measurement every two (2) months for a six (6) month period, then will receive a blood lead measurement every six (6) months or when they are terminated. The frequency of blood lead testing is dependent upon receiving personal air monitoring results.

If field personnel are on site for thirty (30) days or more, they will participate in a medical examination program according to OSHA's lead (29 CFR 1926.62) and arsenic (29 CFR 1926.1118) standards.

If personal air monitoring indicates exposures above the action level for cadmium (2.5 μ/m^3), field personnel on site for thirty (30) days or more will be required to complete the medical requirements of OSHA's cadmium (29 CFR 1926.1127) standard.

7. DECONTAMINATION

7.1 FIELD PERSONNEL

At the beginning of the shift, field personnel will remove street clothing and place clothing into a clean side storage facility then dress into work clothing. Laundered coveralls and cleaned respirators shall be available at the beginning of every shift.

During breaks and at the end of the shift, remedial personnel will be decontaminated using two stages. Within the boundary of the Exclusion Zones, remedial personnel will perform gross decontamination of outer protective garments, gloves and boots. No remedial personnel are allowed outside of the Exclusion Zone without performing gross decontamination.

After gross decontamination, during breaks and at the end of the shift, remedial personnel will proceed to the change facility and place work clothing into a receptacle marked "coveralls" to be laundered (at the end of the shift) or hung in the dirty storage facility (during breaks). Work clothing cannot be worn in any of the designated "clean" areas. Respirators will be removed and placed either in a container marked "respirators" to be cleaned (at the end of the shift), or placed into an area where it will be kept clean and not damaged.

During breaks, remedial workers must wash hands and face (especially before eating, drinking, smoking, or chewing) before leaving the change facility and entering the office and/or lunch facility. At the end of the shift, all remedial workers are required to place work clothes worn under cloth coveralls into the dirty side storage facility, wash hands and face, and dress into street clothes. OSHA standards 1926.62(3)(i)(ii) require showering at the end of the shift if exposure exceeds the PEL. Field personnel are responsible to launder work clothes worn under the cloth coveralls. It is recommended that when these clothes are taken home, they should be put into a plastic bag and laundered separately from any other clothing.

7.2 EQUIPMENT

All equipment will be grossly decontaminated before leaving the exclusion zone. The cabs of equipment contaminated with exclusion zone materials will be cleaned regularly. All equipment will be steam cleaned and the interior thoroughly cleaned before equipment leaves the ASARCO East Helena Plant site. The ASARCO East Helena Plant has an equipment wash bay.

8. EMERGENCY RESPONSE

8.1 MEDICAL EMERGENCIES

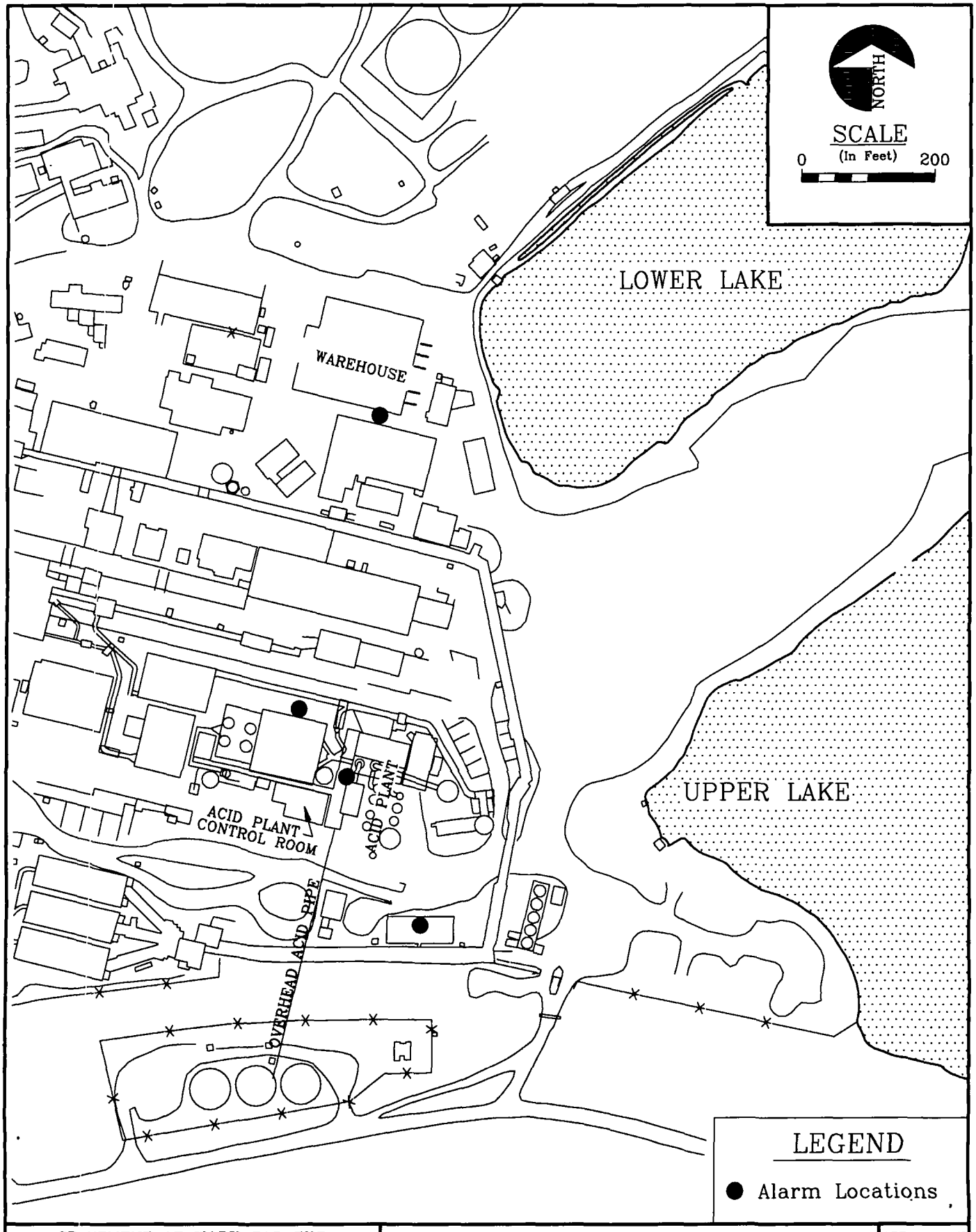
Medical facilities are on the ASARCO plant site and are available for emergencies. The emergency route to local medical facilities is in Appendix E.

All accidents or potentially hazardous conditions will be handled in a manner to minimize the health risk to personnel. All accidents/hazardous conditions will be reported to the Site Safety Officer.

Communication to outside emergency services can be accomplished through use of telephones or two-way radios, and through the ASARCO fire alarm system. Emergency Response telephone numbers are listed in Appendix F. The nearest alarm boxes to the project area are located near the entrance to the warehouse (Figure 8-1). Once the alarm box has been activated, all available EMT's (Emergency Medical Technicians) as well as the City of East Helena Volunteer Fire Department will respond to the location of the alarm box pulled. **The person pulling the alarm needs to remain at the alarm box until emergency responders arrive**. Approximately 4 to 5 EMT's are available to respond during the day shift and 1 to 2 EMT's during the late afternoon and night shift. An assessment of the emergency will be made by the first EMT responding to the scene.

After emergency services are contacted, immediately notify one of the ASARCO emergency contacts listed in Appendix F.

As soon as practical following an accident/incident, the accident/incident will be documented using the appropriate report forms. The documentation shall be submitted to the Site Safety Officer. The Project Engineer shall also receive a copy of the accident report.



STATEMENT OF WORK FOR THE
ASARCO EAST HELENA PLANT
CONSENT DECREE
SUPPLEMENTAL ENVIRONMENTAL PROJECT

LOCATION OF FIRE ALARM BOXES

APPENDIX H

8-1

UPDATE TIME: 8:05AM
007\0871\065\0127\HEL\062998\I:\STORAGE\87198A09.DWG

8.1.1 Fires

Those closest to the incident will take measures to extinguish the fire in the beginning stage using a fire extinguisher. If the fire goes beyond the beginning stages, the General Supervisor will evacuate the immediate area and summon emergency services using the same procedures specified in Section 8.1 "Medical Emergencies".

8.1.2 On Site Emergency Equipment

The following emergency equipment will be maintained at all work sites.

- First-aid kit
- Fire extinguisher
- Emergency eye wash solution
- Petroleum absorbent materials

APPENDIX A

STANDARDS AND EXPOSURE GUIDE FOR CHEMICAL SUBSTANCES OF CONCERN

APPENDIX A

STANDARDS AND EXPOSURE GUIDE FOR CHEMICAL SUBSTANCES OF CONCERN

RELEVANT STANDARDS AND EXPOSURE GUIDELINES:

- Occupational Safety and Health Administration (OSHA)
- Permissible Exposure Limits (PEL's)

- National Institute for Occupational Safety and Health (NIOSH)
- Immediate Danger to Life and Health (IDLH) Guidelines

- American Conference of Governmental Industrial Hygienists (AGCY.)
- Threshold Limit Values (LTV's)

HEALTH AND SAFETY
STANDARDS AND EXPOSURE GUIDELINES
FOR CONTAMINANTS OF CONCERN

			NIOSH REEL	
AS No.	Substance	OSHA PEL	AGCY. LTV	Level
7440-43-9	Cadmium Particulate	5 $\mu g/M^3$	50 $\mu g/M^3$	CA
7740-38-2	Arsenic and Compounds	10 $\mu g/M^3$	200 $\mu g/M^3$	CA
7439-92-1	Lead, Inorganic Fumes and Dusts (as Pb)	50 $\mu g/M^3$ 8-HR TAW	150 $\mu g/M^3$ LTV-TAW	Variable

NOTES:
1) mg/M^3 = milligrams per cubic meter
2) $\mu g/M^3$ = micrograms per cubic meter
3) TAW = Time Weighted Average
4) HR = Hour
5) CA = Carcinogen
6) REEL = Recommended Exposure Limit
7) STEEL= Short Term Exposure Limit

APPENDIX B

LEAD HEALTH DATA
(QUOTED FROM 29 CFR 1926.62)

APPENDIX B
LEAD HEALTH DATA

A. WAYS IN WHICH LEAD ENTERS YOUR BODY

When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until after years of exposure have passed.

Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or makeup which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to organs and whole body systems.

B. EFFECTS OF OVEREXPOSURE TO LEAD

Short-term (Acute) Overexposure

Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardio-respiratory arrest. A short-term dose of lead can lead to acute encephalopathy. Short-term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes which arise after periods of exposure as short as days or as long as several years.

Long-term (Chronic) Overexposure

Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic, there may be severe abdominal pain.

Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood. The levels of lead anticipated in the removal activities are not expected to be near the levels which cause the preceding condition.

APPENDIX C

ARSENIC HEALTH DATA

(QUOTED FROM 29 CFR 1910.1018)

APPENDIX C
ARSENIC HEALTH DATA

A. COMMENTS

The health hazard of inorganic arsenic is high.

B. WAYS IN WHICH THE CHEMICAL AFFECTS YOUR BODY

Exposure to airborne concentrations of inorganic arsenic may cause lung cancer, and can be a skin irritant. Inorganic arsenic may also affect your body if swallowed. One compound in particular, arsenic trichloride, is especially dangerous because it can be absorbed readily through the skin. Because inorganic arsenic is a poison, you should wash your hands thoroughly prior to eating or smoking.

NONCARCINOGENIC EFFECTS

The OSHA standard is based on minimizing risk of exposed workers dying of lung cancer from exposure to inorganic arsenic. It will also minimize skin cancer from such exposures.

The following three sections quoted from "Occupational Diseases: A Guide to Their Recognition", Revised Edition, June 1977, National Institute for Occupational Safety and Health is included to provide information on the nonneoplastic effects of exposure to inorganic arsenic. Such effects should not occur if the OSHA standards are followed.

A. LOCAL

Trivalent arsenic compounds are corrosive to the skin. Brief contact has no effect but prolonged contact results in a local hyperemia and later vesicular or pustular eruption. The moist mucous membranes are most sensitive to the irritant action. Conjunctiva, moist and macerated areas of skin, the eyelids, the angles of the ears, nose, mouth, and respiratory mucosa are also vulnerable to the irritant effects. The wrists are common sites of

dermatitis, as are the genitalia if personal hygiene is poor. Perforations of the nasal septum may occur. Arsenic trioxide and pentoxide are capable of producing skin sensitization and contact dermatitis. Arsenic is also capable of producing keratoses, especially of the palms and soles.

B. SYSTEMIC

The acute toxic effects of arsenic are generally seen following ingestion of inorganic arsenic compounds. This rarely occurs in an industrial setting. Symptoms develop within 1/2 to 4 hours following ingestion and are usually characterized by constriction of the throat followed by dysphagia, epigastric pain, vomiting, and watery diarrhea. Blood may appear in vomitus and stools. If the amount ingested is sufficiently high, shock may develop due to severe fluid loss, and death may ensue in 24 hours. If the acute effects are survived, exfoliative dermatitis and peripheral neuritis may develop.

Cases of acute arsenical poisoning due to inhalation are exceedingly rare in industry. When it does occur, respiratory tract symptoms -- cough, chest pain, dyspnea -- giddiness, headache, and extreme general weakness precede gastrointestinal symptoms. The acute toxic symptoms of trivalent arsenical poisoning are due to severe inflammation of the mucous membranes and greatly increased permeability of the blood capillaries.

Chronic arsenical poisoning due to ingestion is rare and generally confined to patients taking prescribed medications. However, it can be a concomitant of inhaled inorganic arsenic from swallowed sputum and improper eating habits. Symptoms are weight loss, nausea and diarrhea alternating with constipation, pigmentation and eruption of the skin, loss of hair, and peripheral neuritis. Chronic hepatitis and cirrhosis have been described. Polyneuritis may be the salient feature, but more frequently there are numbness and parasthenias of "glove and stocking" distribution. The skin lesions are usually melanotic and keratotic and may occasionally take the form of an intradermal cancer of the squamous, cell type, but without infiltrative properties. Horizontal white lines (striations) on the

fingernails and toenails are commonly seen in chronic arsenical poisoning and are considered to be a diagnostic accompaniment of arsenical polyneuritis.

Inhalation of inorganic arsenic compounds is the most common cause of chronic poisoning in the industrial situation. This condition is divided into three phases based on signs and symptoms.

First Phase: The worker complains of weakness, loss of appetite, some nausea, occasional vomiting, a sense of heaviness in the stomach, and some diarrhea.

Second Phase: The worker complains of conjunctivitis, a catarrhal state of the mucous membranes of the nose, larynx, and respiratory passage. Coryza, hoarseness, and mild tracheobronchitis may occur. Perforation of the nasal septum is common, and is probably the most typical lesion of the upper respiratory tract in occupational exposure to arsenical dust. Skin lesions, eczematoid and allergic in type, are common.

Third Phase: The worker complains of symptoms of peripheral neuritis, initially of hands and feet, which is essentially sensory. In more severe cases, motor paralyses occur; the first muscles affected are usually the toe extensors and the peronei. In only the most severe cases will paralysis of flexor muscles of the feet or of the extensor muscles of hands occur.

Liver damage from chronic arsenical poisoning is still debated, and as yet the question is unanswered. In cases of chronic and acute arsenical poisoning, toxic effects to the myocardium have been reported based on EKG changes. These findings, however, are now largely discounted and the EKG changes are ascribed to electrolyte disturbances concomitant with arsenicalism. Inhalation of arsenic trioxide and other inorganic arsenical dusts does not give rise to radiological evidence or pneumoconiosis. Arsenic does have a depressant effect upon the bone marrow, with disturbances of both erythropoiesis and myelopoiesis.

APPENDIX D

CADMIUM HEALTH DATA

(QUOTED FROM 29 CFR 1926.1127)

APPENDIX D

CADMIUM HEALTH DATA

A. ROUTES OF EXPOSURE

Cadmium can cause local skin or eye irritation. Cadmium can affect your health if you inhale it or if you swallow it.

B. EFFECTS OF OVEREXPOSURE.

Short-term (Acute) Exposure

Cadmium is much more dangerous by inhalation than by ingestion. High exposures to cadmium that may be immediately dangerous to life or health occur in jobs where workers handle large quantities of cadmium dust or fume; heat cadmium-containing compounds or cadmium-coated surfaces; weld with cadmium solders or cut cadmium-containing materials such as bolts.

Severe Exposure May Occur Before Symptoms Appear

Early symptoms may include mild irritation of the upper respiratory tract, a sensation of constriction of the throat, a metallic taste and/or a cough. A period of 1-10 hours may precede the onset of rapidly progressing shortness of breath, chest pain, and flu-like symptoms with weakness, fever, headache, chills, sweating and muscular pain. Acute pulmonary edema usually develops within 24 hours and reaches a maximum by three days. If death from asphyxia does not occur, symptoms may resolve within a week.

Long-term (Chronic) Exposure

Repeated or long-term exposure to cadmium, even at relatively low concentrations, may result in kidney damage and an increased risk of cancer of the lung and of the prostate.

EMERGENCY FIRST AID PROCEDURES

Eye Exposure

Direct contact may cause redness or pain. Wash eyes immediately with large amounts of water, lifting the upper and lower eyelids. Get medical attention immediately.

Skin Exposure

Direct contact may result in irritation. Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water. Get medical attention immediately.

Ingestion

Ingestion may result in vomiting, abdominal pain, nausea, diarrhea, headache and sore throat. Treatment for symptoms must be administered by medical personnel. Under no circumstances should the employer allow any person whom he retains, employs, supervises or controls to engage in therapeutic chelation. Such treatment is likely to translocate cadmium from pulmonary or other tissue to renal tissue. Get medical attention immediately.

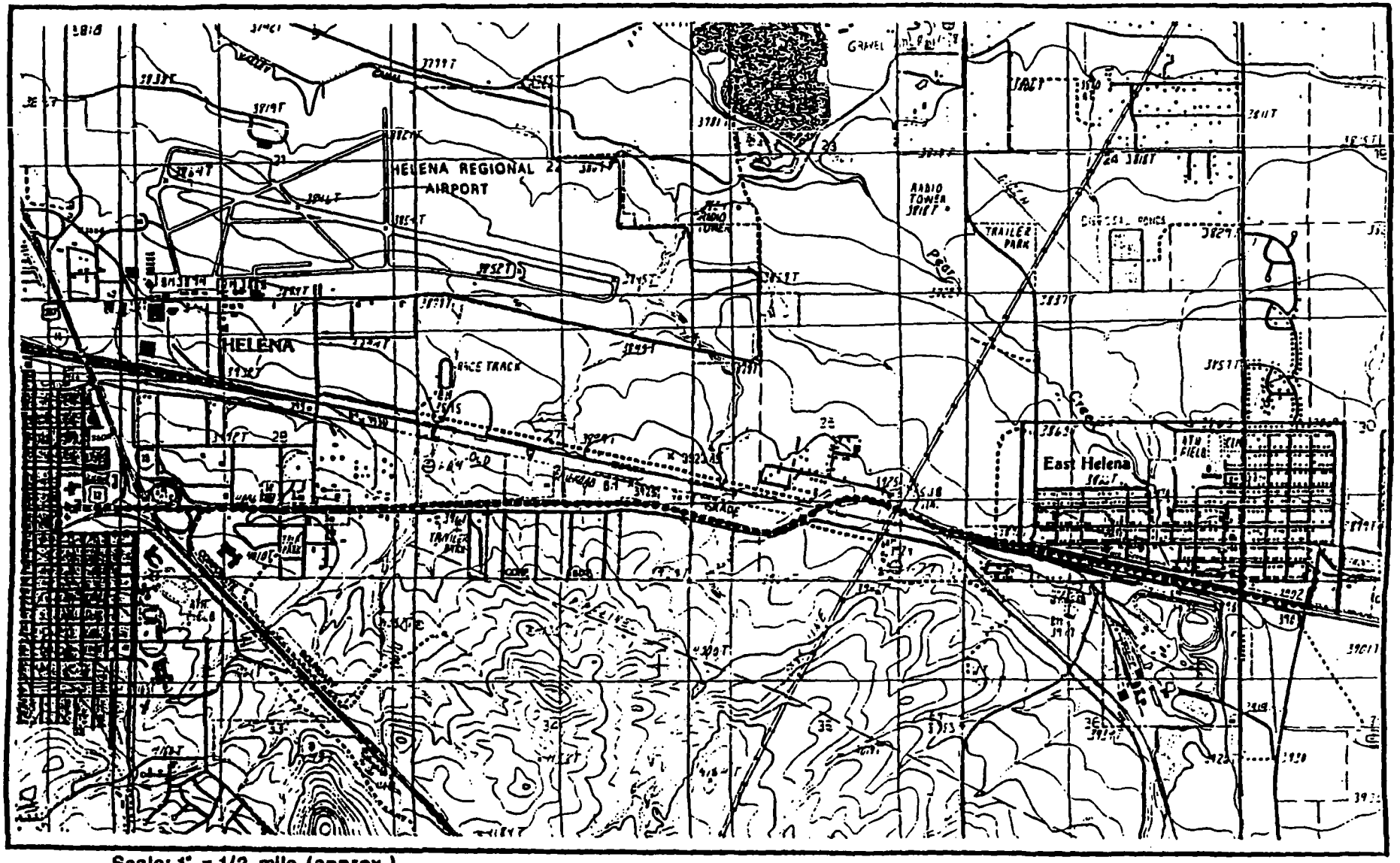
Inhalation

If large amounts of cadmium are inhaled, the exposed person must be moved to fresh air at once. If breathing has stopped, perform cardiopulmonary resuscitation. Administer oxygen if available. Keep the affected person warm and at rest. Get medical attention immediately.

Rescue

Move the affected person from the hazardous exposure. If the exposed person has been overcome, attempt rescue only after notifying at least one other person of the emergency and putting into effect established emergency procedures. Do not become a casualty yourself. Understand your emergency rescue procedures and know the location of the emergency equipment before the need arises.

APPENDIX E
EMERGENCY ROUTE TO HOSPITAL



Scale: 1" = 1/2 mile (approx.)

NORTH

Route to St. Peters Hospital
Emergency Route

APPENDIX F

PROJECT EMERGENCY FACILITIES AND CONTACTS

APPENDIX F

PROJECT EMERGENCY FACILITIES AND CONTACTS

General Emergency Numbers:

Fire:	911
Ambulance:	911
Police:	911
Sheriff:	911

ASARCO East Helena Plant

Emergency Contacts:

Kim Bradshaw	(Office)	227-7129
	(Mobile)	439-1703
	(Home)	442-4547
Lloyd Doney	(Office)	227-7139
	(Mobile)	439-1704
	(Home)	277-8535
Gary Hughes	(Office)	227-7152
	(Mobile)	439-3713
	(Home)	227-6282
Tom McIntyre	(Office)	227-7152
	(Mobile)	439-1946
	(Home)	494-7628
Blaine Cox	(Office)	227-7183
	(Home)	227-5813

ASARCO East Helena Plant

Project Management Contacts:

Jon Nickel	(Office)	227-7191
John Cavanaugh	(Office)	227-7105
	(24-Hour Emergency)	227-4015

St. Peter's Hospital: (Emergency) 444-2150
(General) 442-2480

Poison Control Center: 1-800-525-5042

Hydrometrics, Inc. Corporate Contacts

Corporate Health and Safety Officer: Paul Brox
(Office) 406-227-3341
(Home) 406-494-5162

Corporate Officers:

President: Robert D. Braico
(Office) 406-443-4150, ext. 170
(Home) 406-442-0923

Vice President, Administration and Finance: Jay Spickelmier
(Office) 406-443-4150, ext. 168
(Home) 406-475-3846

OTHER RESOURCES:

Montana Department of Environmental Quality (MDEQ), Solid & Hazardous Waste Management Bureau		406-444-3490
National Response Center		800-424-8802
Superfund/RCRA Hotline		800-424-9346
TSCA Hotline		800-424-9065
Centers for Disease Control	Day:	404-329-3311
	Night:	404-329-2888
U.S. EPA Environmental Response Team		201-321-6660
Occu-Safe		406-494-4365
Lewis & Clark County LEPC, Paul Spengler, Director Disaster & Emergency Services		406-447-8285

OFFICE LOCATIONS FOR HYDROMETRICS, INC.

HELENA (Corporate)
2727 Airport Road
Helena, MT 59601
Phone: (406) 443-4150
FAX: (406) 443-1252

TACOMA
950 Pacific Avenue # 700
Tacoma, WA 98402
Phone: (253) 572-5481
FAX: (253) 572-5487

SPOKANE
201 W. North River Drive
Suite 440
Spokane, WA 99201
Phone: (509) 328-3589
FAX: (509) 328-3827

TUCSON
3275 W. Ina Road, Suite 205
Tucson, AZ 85741
Phone: (520) 544-3150
FAX: (520) 544-3190

EAST HELENA
2 South Morton Street
East Helena, MT 59635
Phone: (406) 227-3341
FAX: (406) 227-3364

BILLINGS
5825 Lazy Lane
Billings, MT 59106
Phone: (406) 656-1172
FAX: (406) 656-8912

DENVER
495 East 51st Avenue
P.O. Box 16047
Denver, CO 80216
Phone: (303) 297-3109
FAX: (303) 297-3818

EL PASO
2301 W. Paisano Drive
El Paso, TX 79911
Phone: (915) 532-3489
FAX: (915) 532-4897

KALISPELL
22 - 2nd Avenue
Suite 1100
Kalispell, MT 59901
Phone: (406) 756-0198
FAX: (406) 755-5990

KELLOGG
316 North Division
Kellogg, ID 83837
Phone: (208) 784-1503
FAX: (208) 784-0135

RUSTON
5227 North 49th Street
Tacoma, WA 98407
Phone: (253) 759-1265
FAX: (253) 759-1267